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Daily Camera reporter **Todd Neff** writes about science and the environment. His blog expands on articles he's written and touches on other interesting topics in the science field.

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## NOAA tests unmanned aircraft

### Altair a modified version of the military's Predator B drone

By **Todd Neff**, Camera Staff Writer  
May 2, 2005

A group of Boulder NOAA scientists are testing a Lear Jet-sized remote-control aircraft they hope will improve their understanding of the Earth's oceans and atmosphere.

The U.S. military has deployed unmanned aerial vehicles such as the Global Hawk and the Predator for years in surveillance — and, when outfitted with missile launchers, search-and-destroy missions.

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But flights planned for the coming weeks will be the first to test whether and how a full-scale UAV with a major research payload can contribute to science.

The National Oceanic and Atmospheric Administration, NASA and UAV maker General Atomics Aeronautical Systems are cooperating on the effort. They're using a modified General Atomics Predator B military bird called the Altair.

Short test flights began April 14 at Gray Butte Airfield in California and continued through this week. In the coming days, a series of flights over the Pacific lasting as long as 20 hours are scheduled, said David Fahey, a research physicist with NOAA's Aeronomy Laboratory in Boulder and a lead scientist in the effort.

The Altair will carry 300 pounds of scientific instruments, fly at speeds of around 200 mph and soar as high as 45,000 feet. It can stay aloft for more than 30 hours, thanks to a gangly 86-foot wingspan.

Four science instruments on the flights will detect ocean color and record the temperature, moisture content and chemical makeup of the atmosphere. A digital camera and combination optical/infrared sensor, both key to the navigation of the UAV, will perform surface mapping.

Two pilots fly the UAV from a "cockpit" station on the ground.

Alexander MacDonald, director of NOAA's Forecast Systems Laboratory in Boulder, first came up with the idea for using UAVs for atmospheric research in the late 1990s, he said.

"They've been around for 25 years," MacDonald said. "But now you have UAVs that can fly to 60,000 feet and go 14,000 miles in a single hop — from any point on Earth to any other point in a single flight."

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UAVs, he said, are particularly good for what he called "dirty, dull and dangerous missions."

Pilots of remote-control aircraft can take lunch breaks and work in shifts during UAV flights lasting as long as 40 hours. "Can you imagine a man sitting in a cramped cockpit for 40 hours?" MacDonald asked.

NOAA could send unmanned aircraft over hurricanes for days at a time. Today, manned flights visit hurricanes for a few hours at a time before having to returning to base.

MacDonald said the current flights will help determine how many of the UAVs NOAA might use.

The marathon capabilities challenge scientists to think of ways to use the new capability, Fahey said.

"This is in some sense a solution waiting for the right kind of problem," he said.

He said the lack of atmospheric data over the world's oceans and a UAV's ability to monitor sprawling marine sanctuaries — also a NOAA mission — are a couple of possible uses.

"We're pioneering this a little bit," Fahey said. "We're clearly not the first to fly a UAV, but we're challenging the system in a way that it hasn't been challenged before."

The project's Altair UAV is the only aircraft of its kind, said Nick Trongale, program manager for General Atomics Aeronautical Systems on the NASA/NOAA experiment. General Atomics owns the plane, worth about \$5 million, he said.

"It's a new area for us, to work in the civilian sector and the science community," Trongale said. "It's the first time anyone has integrated sensor payloads of this quality and quantity on a remotely operated aircraft."

Seven of nine people on the UAV project's science team are from Boulder. Albin Gasiewski of NOAA's Environmental Technology Laboratory is leading the overall science effort with Fahey. James Churnside, James Elkins, Marian Klein, Samuel Oltmans and Brad Orr, representing three NOAA labs, are principal investigators of the aircraft's various instruments. Sara Summers of NOAA Boulder's Forecast Systems Laboratory is deputy project manager.

Contact Camera Staff Writer Todd Neff at (303) 473-1327 or [nefft@dailycamera.com](mailto:nefft@dailycamera.com). For more on this and other stories, visit [www.dailycamera.com/spacetime](http://www.dailycamera.com/spacetime).

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